



US-95: Deep Creek Bridge Replacement

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PROJECT BACKGROUND

Deep Creek Bridge on US Highway 95 is located just west of the intersection of US-95 and ID-6 near the city of Potlatch, Idaho. The bridge was originally constructed in 1939 and is showing signs of aging. While the bridge is still structurally sound, the Idaho Transportation Department (ITD) will replace it in fiscal year 2021 to improve its safety and bring it up to current design standards for highway, bridge, and hydraulic design.

Our group focused on the structural, hydraulic, and transportation aspects of the design. The primary standard used to design the bridge was the American Association of State Highway Transportation Officials (AASHTO) Bridge Design Specifications.

PROJECT OBJECTIVES

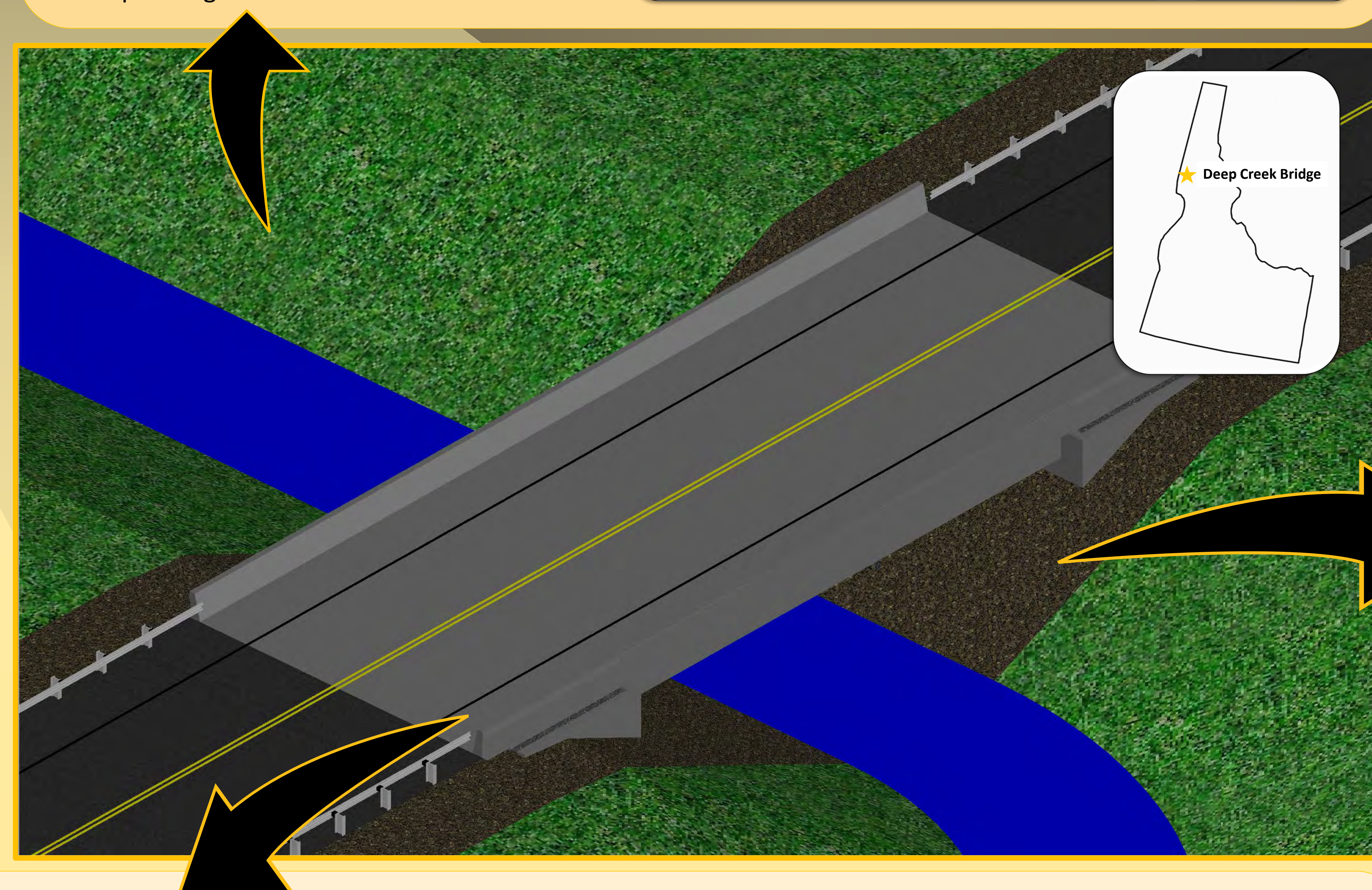
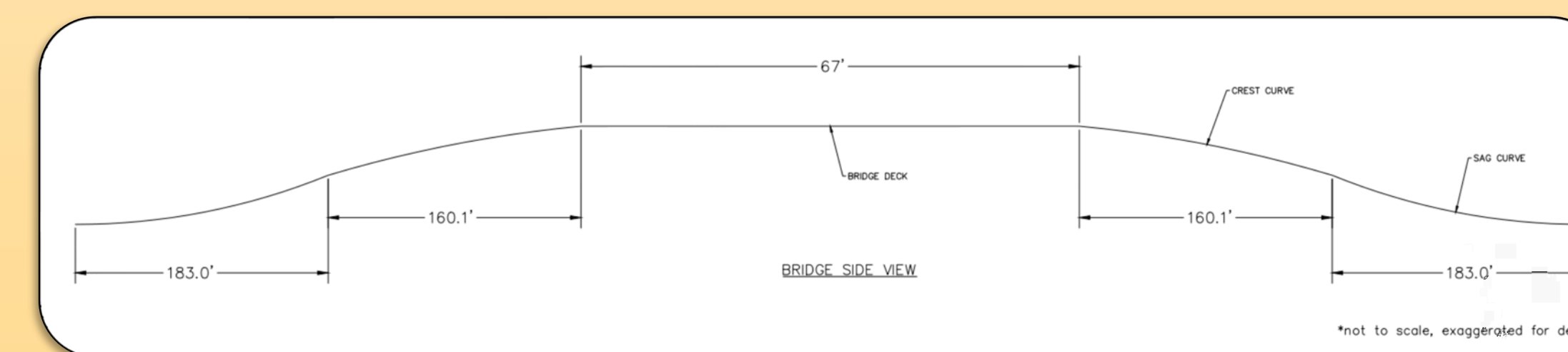
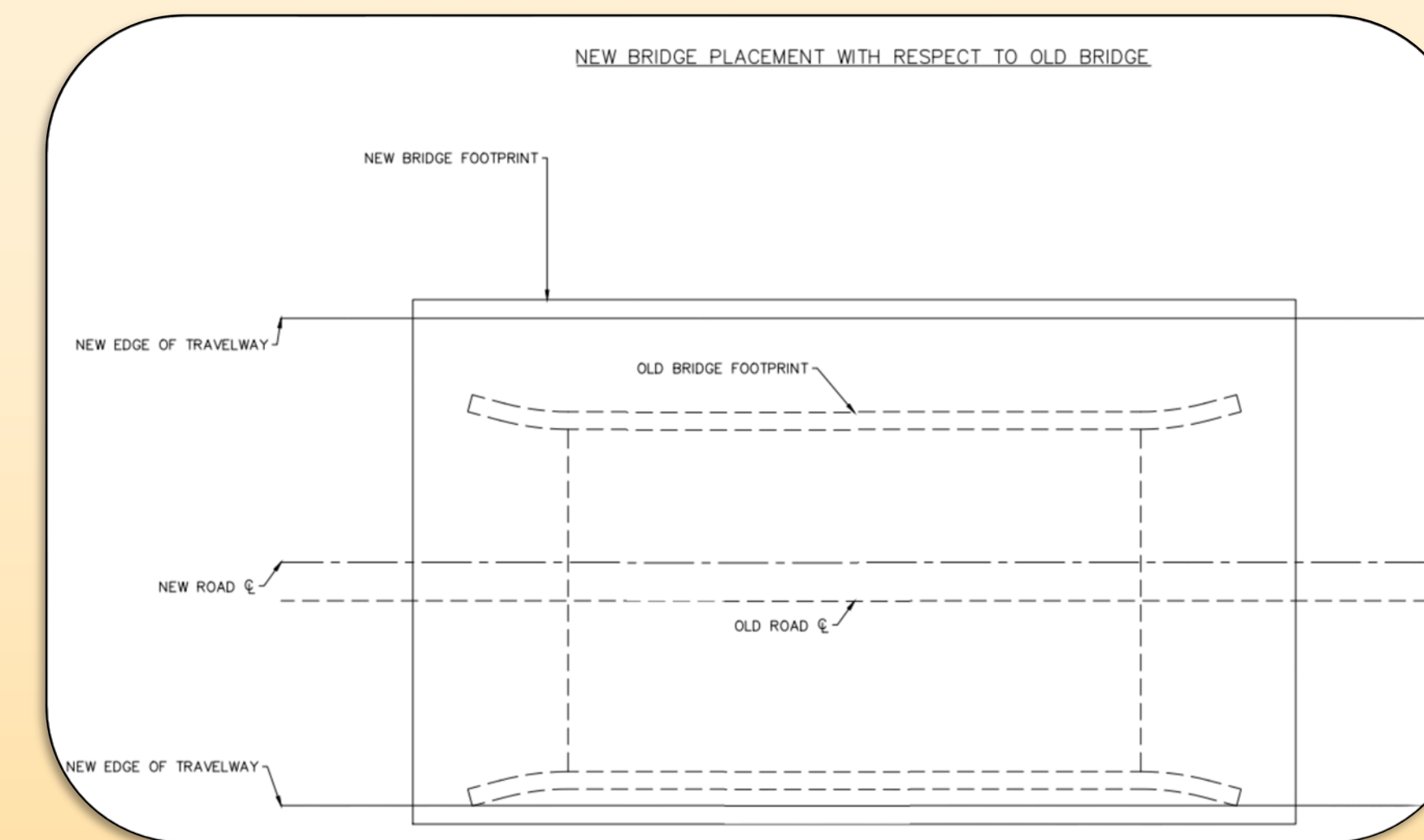
1. Execute good practice in project management, including time tracking, orderly documentation, effective project meetings, clear and concise correspondence, and following a well-defined project plan
2. Conduct a transportation analysis to design the road alignment, guardrail standards, traffic use, pavement approaches (transitions), and width for the new bridge design
3. Conduct hydraulic and hydrologic analyses with the use of modeling to determine the water surface and flow data and perform a scour analysis on the new bridge foundations
4. Conduct a structural analysis to determine loads and design each member of the new bridge according to code

TRANSPORTATION

The bridge width, approaches, guardrail, and vertical alignment were designed to accommodate traffic on US-95 while conforming to ITD highway standards.

Traffic on US-95 is expected to include commercial tractor-trailers as well as agricultural equipment. There is no significant pedestrian use.

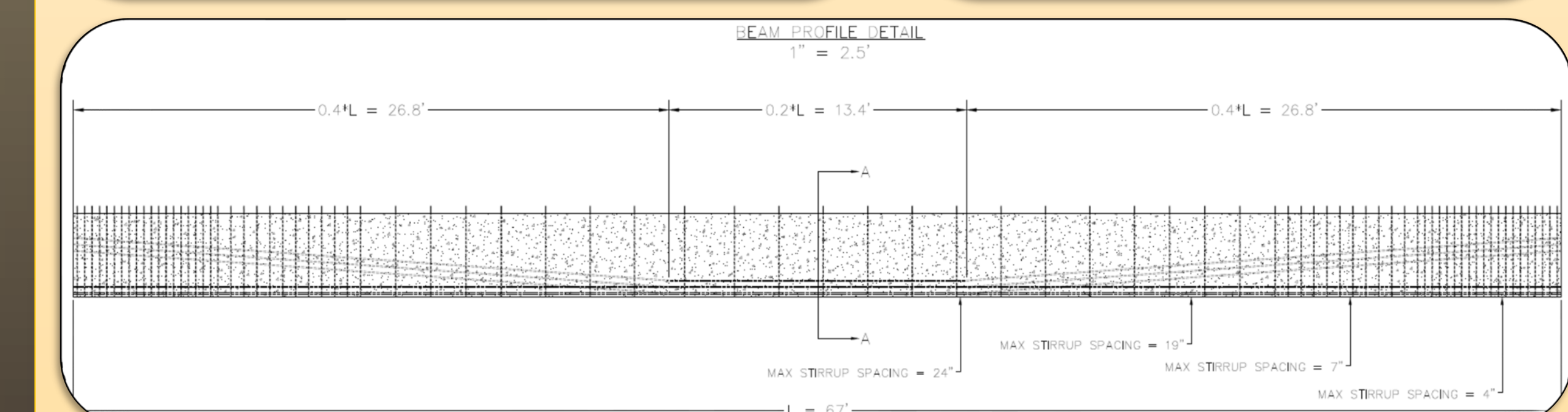
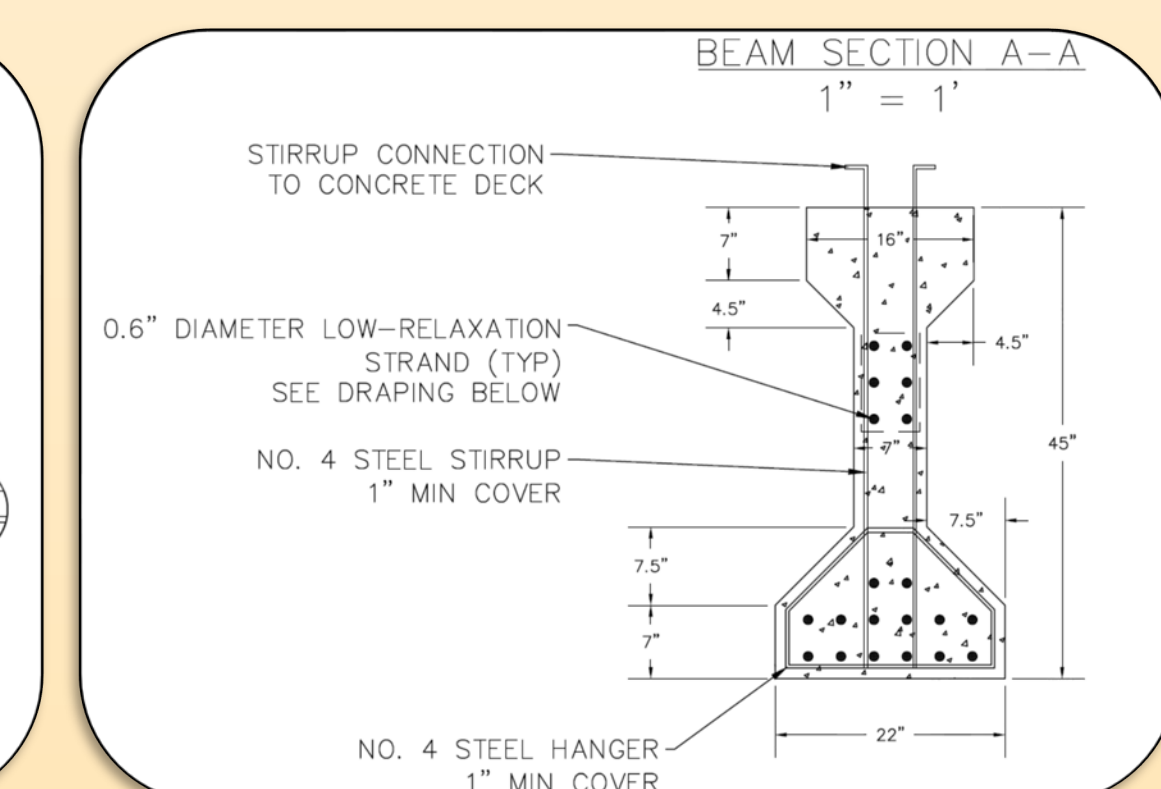
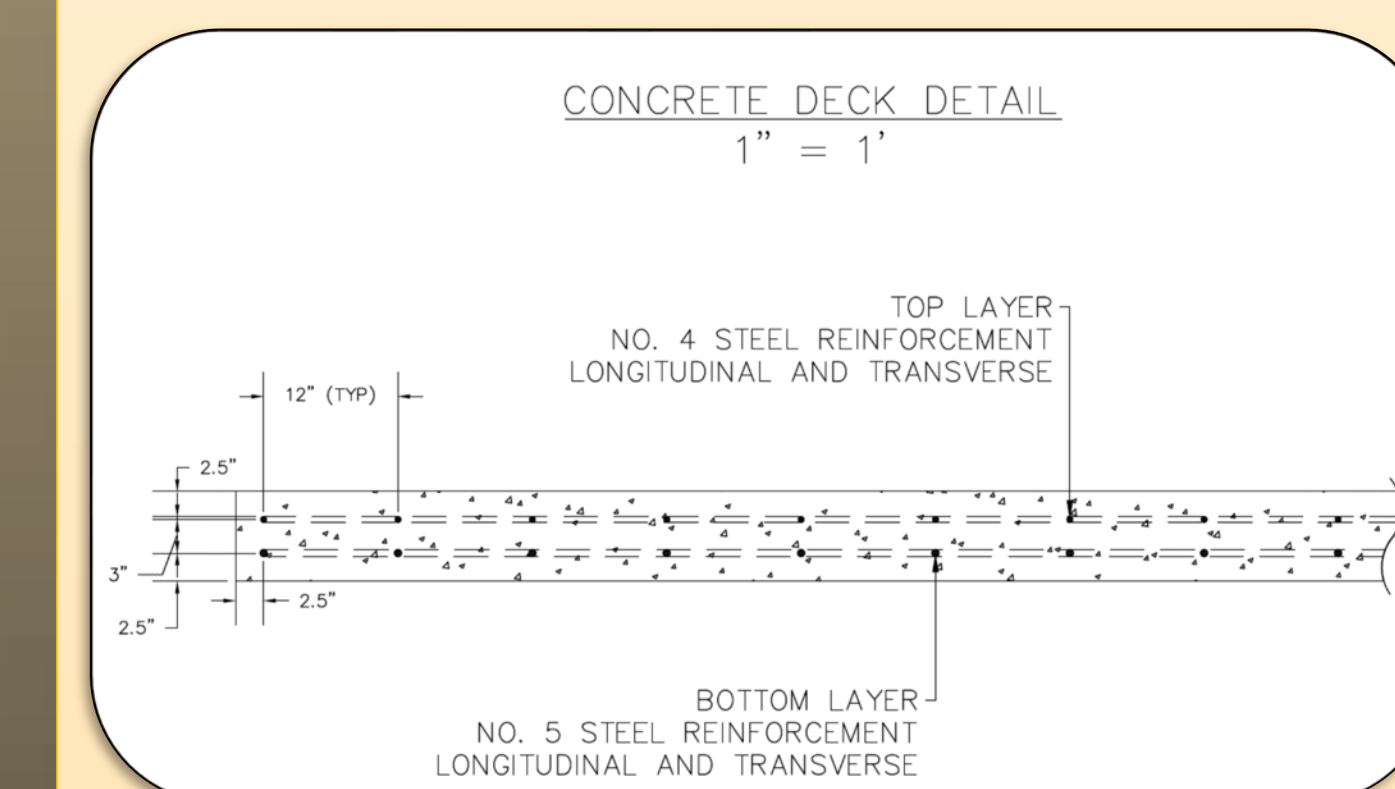
Vertical road alignments were developed to tie the new bridge location into the existing US-95 with a smooth transition that provides adequate sight distance.



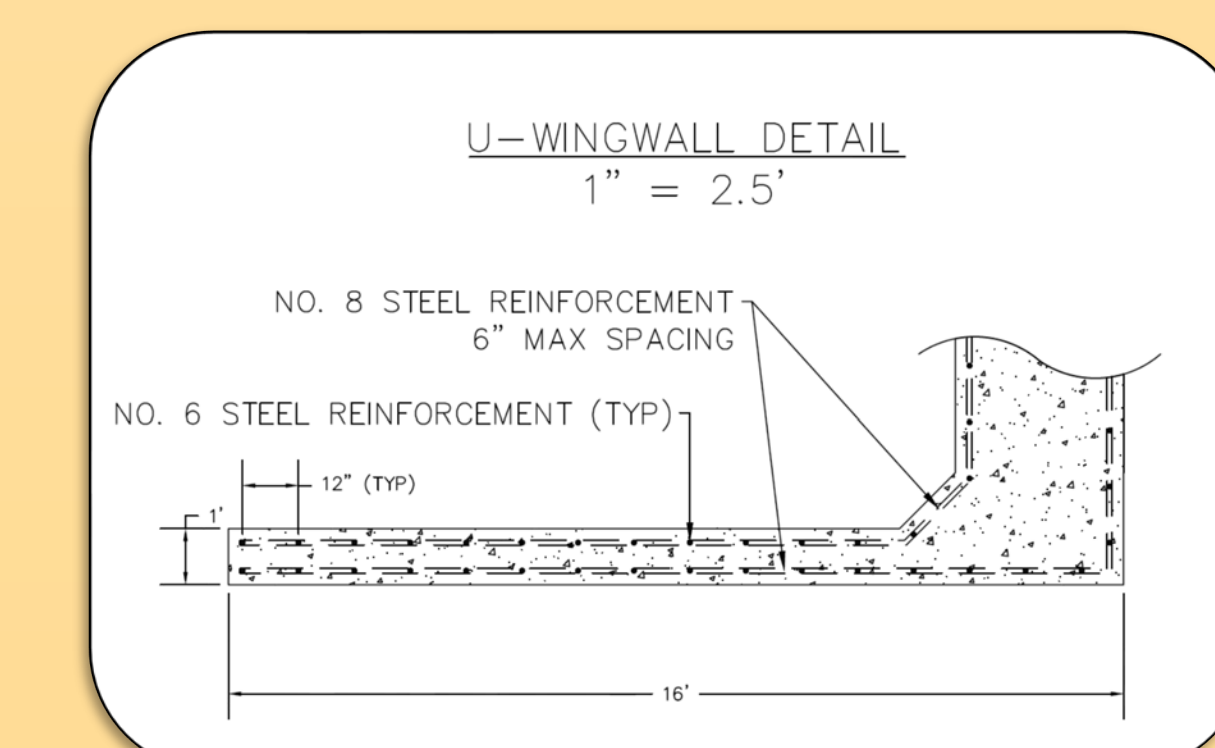
STRUCTURAL

The new single-span bridge has a length of 67' and a width of 39.83'. The updated bridge will accommodate current ITD and AASHTO standards for bridge width, height, and loading conditions.

The final superstructure design will include 42" single slope concrete parapet on both sides of an 8" reinforced, cast-in-place concrete deck resting on five prestressed AASHTO Type III I-beams spaced at 9'.



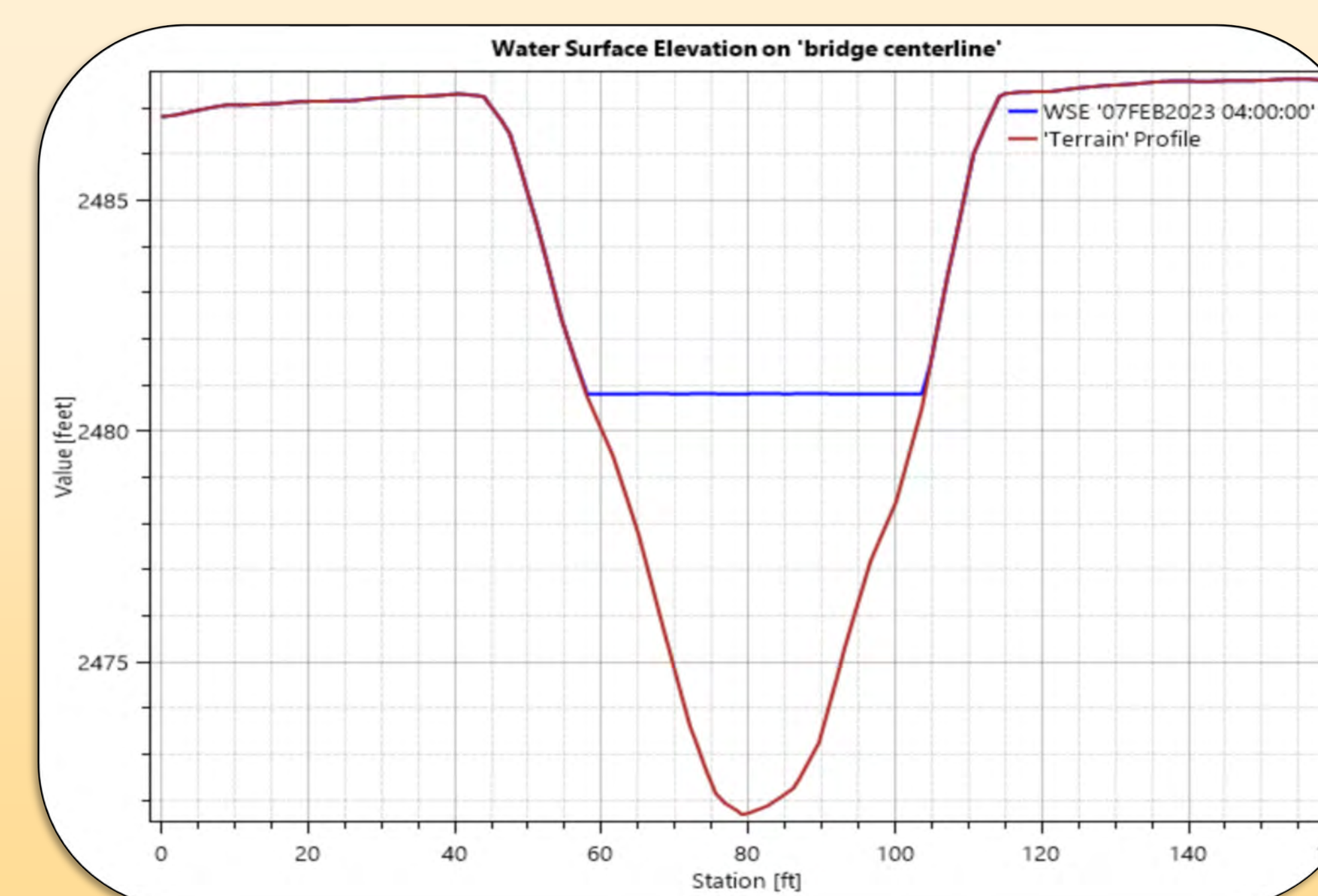
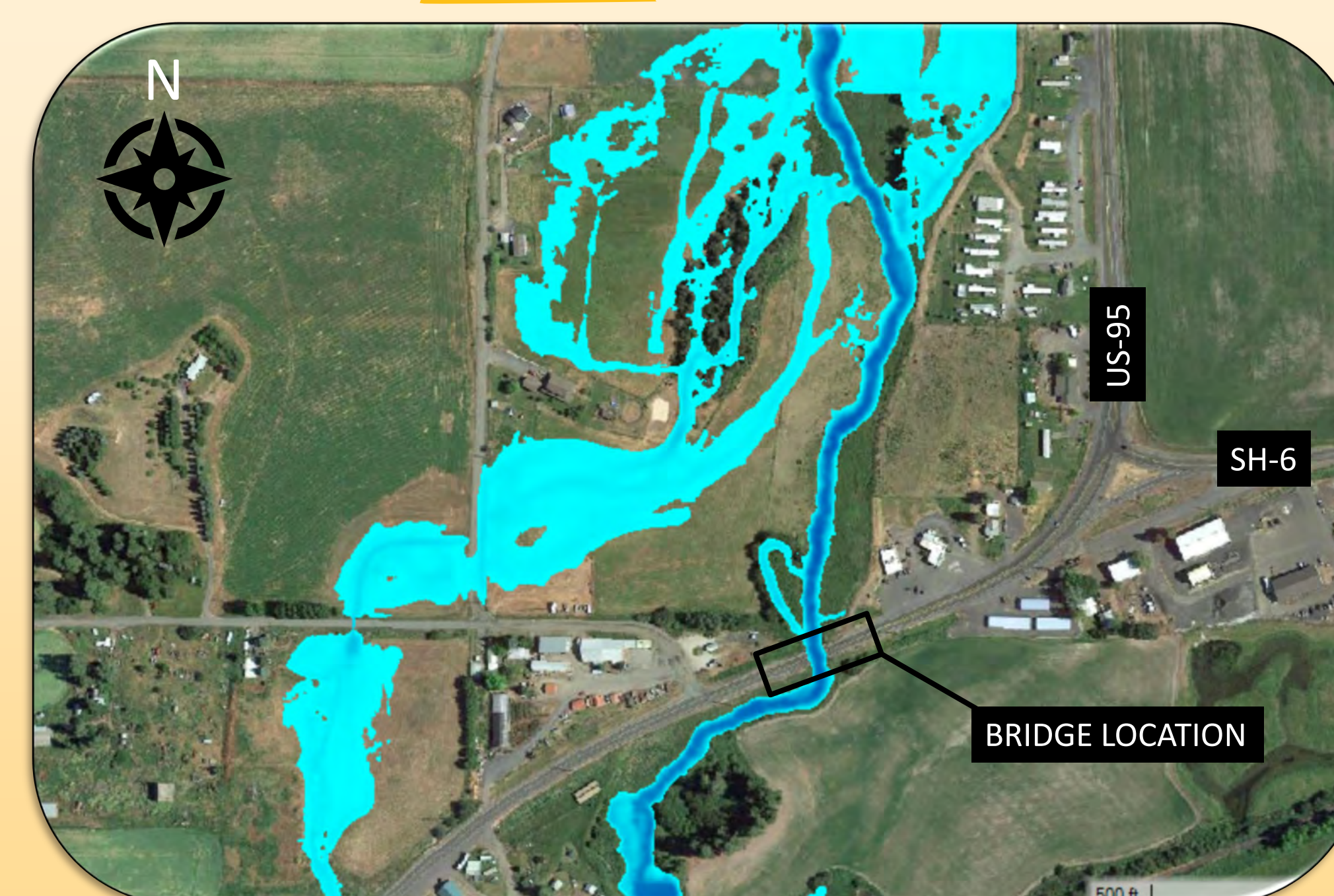
The beams connect to the substructure by an integral abutment with reinforced U-wingwalls on each side. The integral abutment transfers the loads to seven 12.75" outer diameter steel shell piles spaced at 5'.



HYDRAULICS & HYDROLOGY

A hydrologic analysis of Deep Creek was conducted based on data from a stream gauge located on the creek. This data was used to predict peak flows during 50-, 100-, and 500-year floods.

A hydraulic model of the creek and surrounding basin was created using LIDAR data imported into the software package HEC-RAS. This model was used to determine the minimum elevation of the bridge and the size of the riprap needed to prevent scour.



ACKNOWLEDGEMENTS

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